THE ATOM

Los Alamos Scientific Laboratory

HISTORICAL

OFFICE FOR EMERGENCY MANAGEMENT
OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT
1530 P STREET, N.W.
WASHINGTON, D. C.

February 2[illegible], 1943

Dr. J. R. Oppenheimer
University of California
Berkeley, California

Dear Dr. Oppenheimer:

We are addressing this letter to you as the Scientific Director of the special laboratory in New Mexico in order to confirm our many conversations on the matters of organization and responsibility. You are at liberty to show this letter to those with whom you are discussing the desirability of their joining the project with you; they of course realizing their responsibility as to secrecy, including the details of organization and personnel.

The laboratory will be concerned with the development and final manufacture of an instrument of war, which we may designate as Projectile S-1-1. To this end, the laboratory will be concerned with:

A. Certain experimental studies in science, engineering and ordnance; and

B. At a later date large-scale experiments involving difficult ordnance procedures and the handling of highly dangerous material.

The work of the laboratory will be divided into two periods in time; one, corresponding to the work mentioned in section A; the other, that mentioned in section B. During the first period, the laboratory will be on a strictly civilian basis, the personnel, procurement and other arrangements being carried on under a contract arranged between the War Department and the University of California. The conditions of this contract will be essentially similar to that of the usual OSRD contract. In such matters as draft deferment, the policy of the War Department and OSRD in regard to the personnel working under this contract will be essentially identical. When the second division of the work is entered upon (mentioned in B), which will not be earlier than January 1, 1944, the scientific and engineering staff will be composed of commissioned officers. This is necessary because of the dangerous nature of the

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Editor: Kenneth J. Johnson

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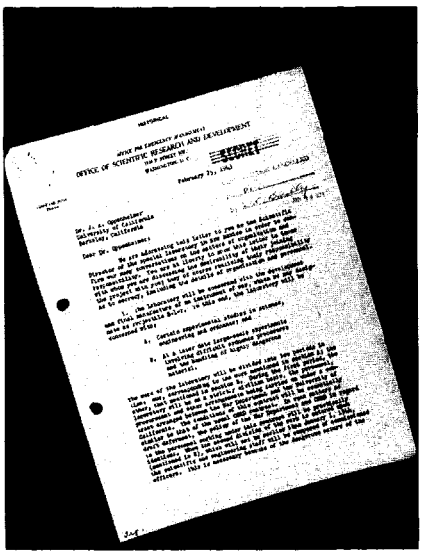


COVER:
The typed page on the cover is the first of three sheets making up one of the earliest documents written pertaining to the Los Alamos Scientific Laboratory. This document and several thousand others were recently declassified at the Laboratory by a team of reviewers assembled by the Atomic Energy Commission's Division of Classification. The other two pages have been reproduced on pages six and seven of this issue of "The Atom" to help illustrate "Declassifying Information—from 'Year One.'"

Colonel Kollman's Tobacco Plantation is contributing to the

Clinical Trial of a Stable Isotope

The film industry long ago stereotyped the tobacco grower as an elderly southern gentleman with white hair, mustache and goatee. He wears a white tropical suit and hat, carries a swagger stick, and smokes cigars. He is called "Colonel," and his acres and acres of tobacco plants are tended by resident laborers.

Victor Kollman is a tobacco grower, but he doesn't fit the stereotype. He doesn't have acres and acres of the plants, and he doesn't have any resident laborers. Kollman is a scientist in Group H-11 at the Los Alamos Scientific Laboratory who is growing a small number of tobacco plants for a scientific project. Although sometimes jokingly referred to as Colonel Kollman's Tobacco Plantation, the project's intent is far more serious.

The plants are being grown for the synthesis of carbon-13-labeled glucose, which is being used in the clinical trial of a new method for the early detection of diabetes. It is being conducted jointly by members of Groups CNC-4 and H-11 at LASL and physicians at the University of New Mexico School of Medicine and Brookhaven National Laboratory.

Unlike the conventional test for diabetes, which requires the extraction and analysis of several blood samples, the carbon-13 method is dependent upon breath analysis. The amount of carbon-13 detected in breath samples indicates normal or diabetic handling of the glucose.

"For this, and other tests, it is necessary for us to convert carbon-13 dioxide, produced by CNC-4, into labeled organic compounds," said Don Ott, H-11 group leader.

"The tobacco plants being grown by Kollman are a part of the con-

continued on next page

Victor Kollman and H-11 Group Leader Don Ott display a leaf from one of the tobacco plants being grown hydroponically for the production of carbohydrates used in the synthesis of carbon-13-labeled glucose. The lights in the foreground are a portion of those used to create a spectrum similar to sunlight.

Enrique Adame tends tobacco plants that have been growing for about a month. Adame, a sophomore, majoring in biology at Highlands University, is working in H-11 under the Laboratory's Undergraduate Cooperative Education Program.

version process. What we're doing is taking advantage of the natural carbon cycle in plants. Leaves cut from the plants take in carbon dioxide, and, by a photosynthetic process, they produce carbohydrates—simple sugars, starch, cellulose. The carbon dioxide taken in by the tobacco leaves is mostly carbon-13. So, the sugars—glucose, fructose, sucrose— and starch produced by the leaves are mostly carbon-13 rather than natural carbon.

"Glucose can be labeled in many ways. For certain purposes, labeling of only one of the six carbon atoms in glucose is desired, and this is done by organic synthesis. We chose biosynthesis (the production of chemical compounds by living organisms) as the simplest method for uniform labeling. The trick is not simply to grow plants because they make the desired sugar, but to find the ones that you can get the most out of for the manpower you put into growing them, and isolating and purifying the labeled compounds. Past experience indicated that tobacco plants would be well suited for the compounds in which we're interested, although, applications on the scale we need had not been attempted. This necessitated the development of new procedures.

The tobacco plants are being grown from seed provided by Professor C. D. Raper of North Carolina University. Kollman is growing them hydroponically with artificial lighting. "Hydroponics," the scientist explained, "is the growing of plantlife in soilless culture. We're growing the tobacco plants in peat moss and vermiculite. The plants can't derive anything from either of these mediums that is life-sustaining. They rely entirely on solutions we give them for growth. We give them the nutrients they need for optimum growth in mixture with water twice a day.

"In lighting, wave length is important. We use 100-watt incandescent and daylight fluorescent lights. This combination provides the plants with a spectrum similar to sunlight."

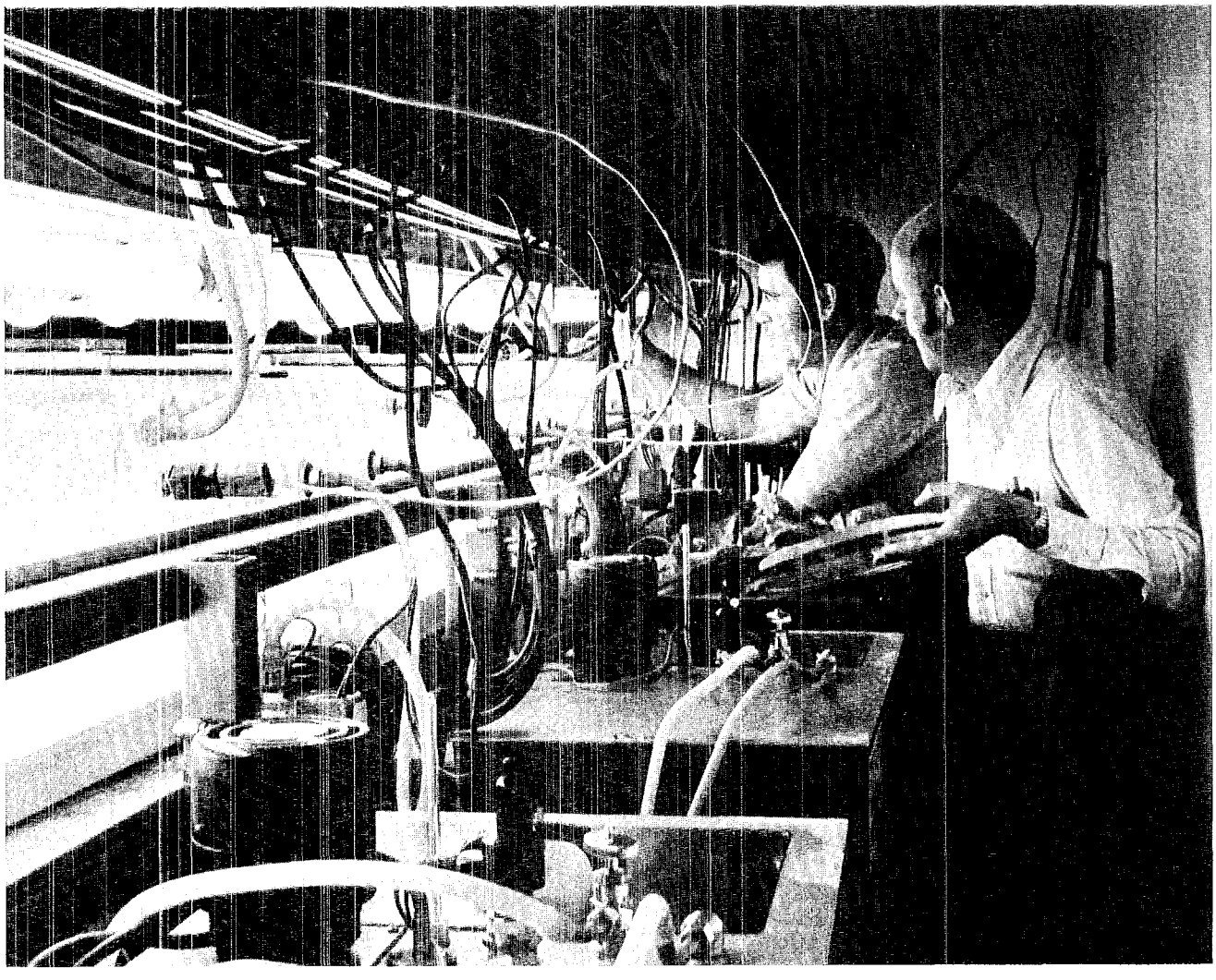
Planting times, Kollman explained, are staggered so that mature leaves are always available for the synthesis of labeled glucose. "It takes about 75 days for the tobacco plants to mature. They grow about three feet per month after the seed has broken ground.

"We cut the leaves from the mature plants and incubate them in darkness for 24 hours. During this period the leaves respire, or metabolize, their natural-carbon sugar reserves. Then we layer a Lucite photosynthesis chamber with the leaves. We fill the chamber with the carbon-13 dioxide the leaves will need to make carbon-13-labeled carbohydrates. We turn on the lights and photosynthetic carbohydrate production goes on for 40 hours. After that, the leaves are frozen in liquid nitrogen to stop photosynthetic production. The

continued on page 5

Max Nevarez and Adame prepare tobacco leaves for incubation, during which the leaves will metabolize their natural-carbon sugar reserves. Nevarez is also a sophomore co-op student majoring in biology at Highlands University.

John Hanners and Kollman layer the bottom of the Lucite photosynthesis chamber with tobacco leaves. The chamber is then filled with the carbon-13 dioxide the leaves will need to produce labeled carbohydrates.



Paul Kraemer loads the affinity chromatography column which is used to separate the carbon-13-labeled glucose from sucrose and fructose.

Charles Gregg and Thomas "Bud" Whaley demonstrate the type of apparatus used by physicians at the University of New Mexico to collect breath samples. A patient breathes into the mass spectrometer bulb through a tube like the one held by Gregg.

B. B. McInteer, associate CNC-4 group leader, and Tom Mills, also of CNC-4, analyze breath samples, using a mass spectrometer. The breath sample is first frozen by immersing the bulb in liquid nitrogen. The liquid-nitrogen container is then removed, and the bulb is allowed to warm. The carbon dioxide is the first of the constituents in the breath sample to vaporize, and this vapor is pumped into the mass spectrometer for analysis of its carbon-13 content.

sugars are extracted, separated and purified."

The sugars are separated by a chemical process called affinity chromatography which capitalizes on their slight structural differences. In mixture, the sugars are put into the affinity column. They separate while being carried by water through the chromatographic resins. The sucrose passes through the column first, followed by glucose and then fructose.

The carbon-13-labeled glucose is sent to the UNM physicians in the form of a concentrated solution. Dr. Jon Shoop and his staff mix this solution with a medicinal-purpose cola which patients take orally. At intervals, the physicians collect breath samples in mass spectrometer bulbs. These are sent back to LASL for analysis by Associate CNC-4 Group Leader B. B. McInteer and Tom Mills, also of CNC-4.

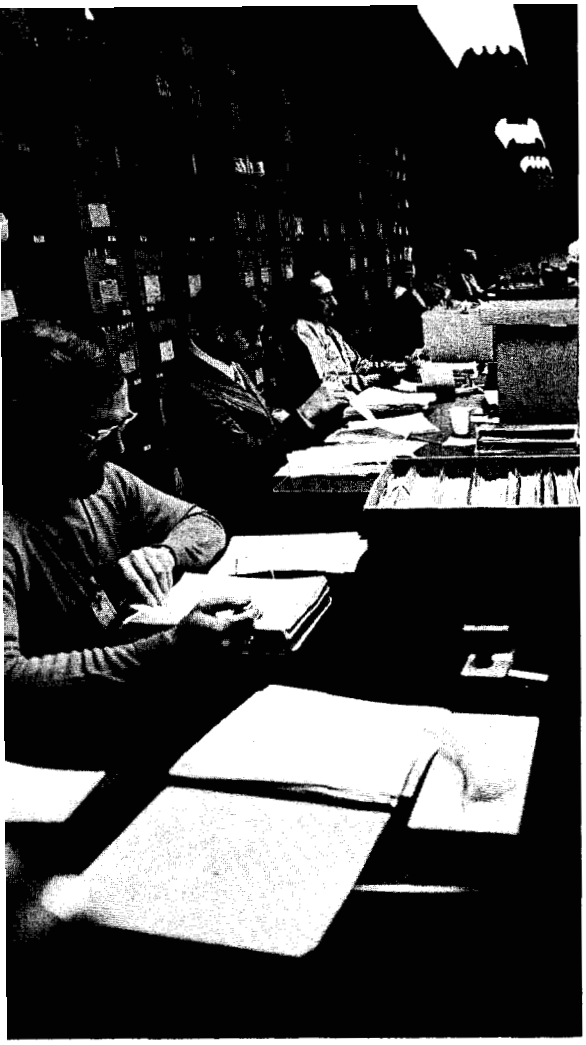
Collaboration between LASL and the School of Medicine for conducting the diabetes test was arranged by Dr. Walton Shreeve of the Medical Division at Brookhaven National Laboratory who was a visiting staff member at Los Alamos. The diabetes test is the first of several planned clinical applications under the Stable Isotopes Program at LASL to reach the trial stage.

The Stable Isotopes Program, funded by the Atomic Energy Commission's Division of Biomedical and Environmental Research (DBER), centers on a small group of naturally occurring rare isotopes of carbon, oxygen, nitrogen and sulfur. Scientists believe these isotopes can be used to perform many important functions for society in a wide variety of fields, including basic research, medicine and environmental control.

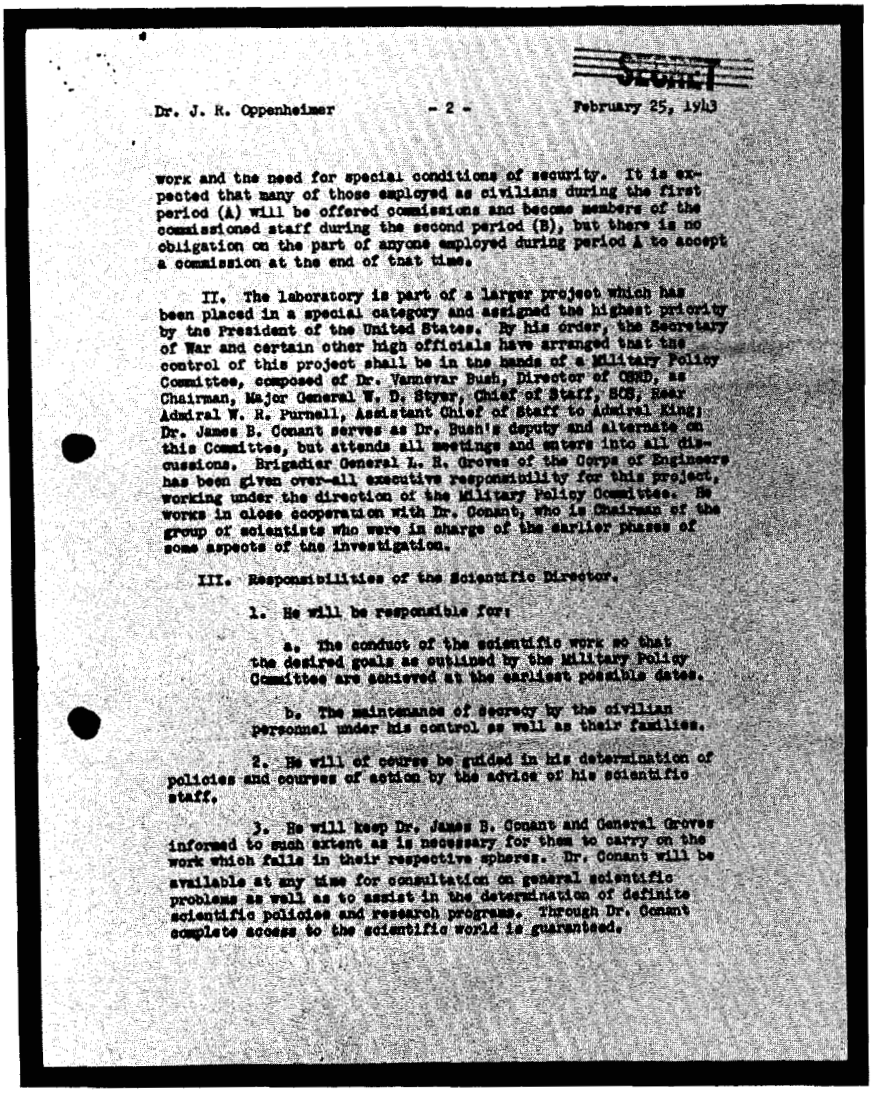
The holdup is wide-spread availability at costs that both science and society can afford. DBER officials believe this problem will be remedied by demonstrating the potential of the stable isotopes for some practical applications. The idea is that successful demonstrations will create a demand for the isotopes that will interest commercial industry in large-scale production at competitive costs.

"The DBER people believe that a clinical application of carbon-13 will have a great impact on production," Ott said. "There are several possible clinical applications for carbon-13. The test for diabetes is the first one to come to trial."

Declassifying Documents



Reviewers consider documents for declassification at the Records Management Center. Behind them are but a small portion of the boxed documents stored at the Center.



SECRET

Dr. J. R. Oppenheimer - 2 - February 25, 1943

work and the need for special conditions of security. It is expected that many of those employed as civilians during the first period (A) will be offered commissions and become members of the commissioned staff during the second period (B), but there is no obligation on the part of anyone employed during period A to accept a commission at the end of that time.

II. The laboratory is part of a larger project which has been placed in a special category and assigned the highest priority by the President of the United States. By his order, the Secretary of War and certain other high officials have arranged that the control of this project shall be in the hands of a Military Policy Committee, composed of Dr. Vannevar Bush, Director of OSRD, as Chairman, Major General W. D. Styer, Chief of Staff, SOS, Rear Admiral W. R. Purnell, Assistant Chief of Staff to Admiral King; Dr. James B. Conant serves as Dr. Bush's deputy and alternate on this Committee, but attends all meetings and enters into all discussions. Brigadier General L. R. Groves of the Corps of Engineers has been given over-all executive responsibility for this project, working under the direction of the Military Policy Committee. He works in close cooperation with Dr. Conant, who is Chairman of the group of scientists who were in charge of the earlier phases of some aspects of the investigation.

III. Responsibilities of the Scientific Director.

1. He will be responsible for:

a. The conduct of the scientific work so that the desired goals as outlined by the Military Policy Committee are achieved at the earliest possible dates.

b. The maintenance of secrecy by the civilian personnel under his control as well as their families.

2. He will of course be guided in his determination of policies and courses of action by the advice of his scientific staff.

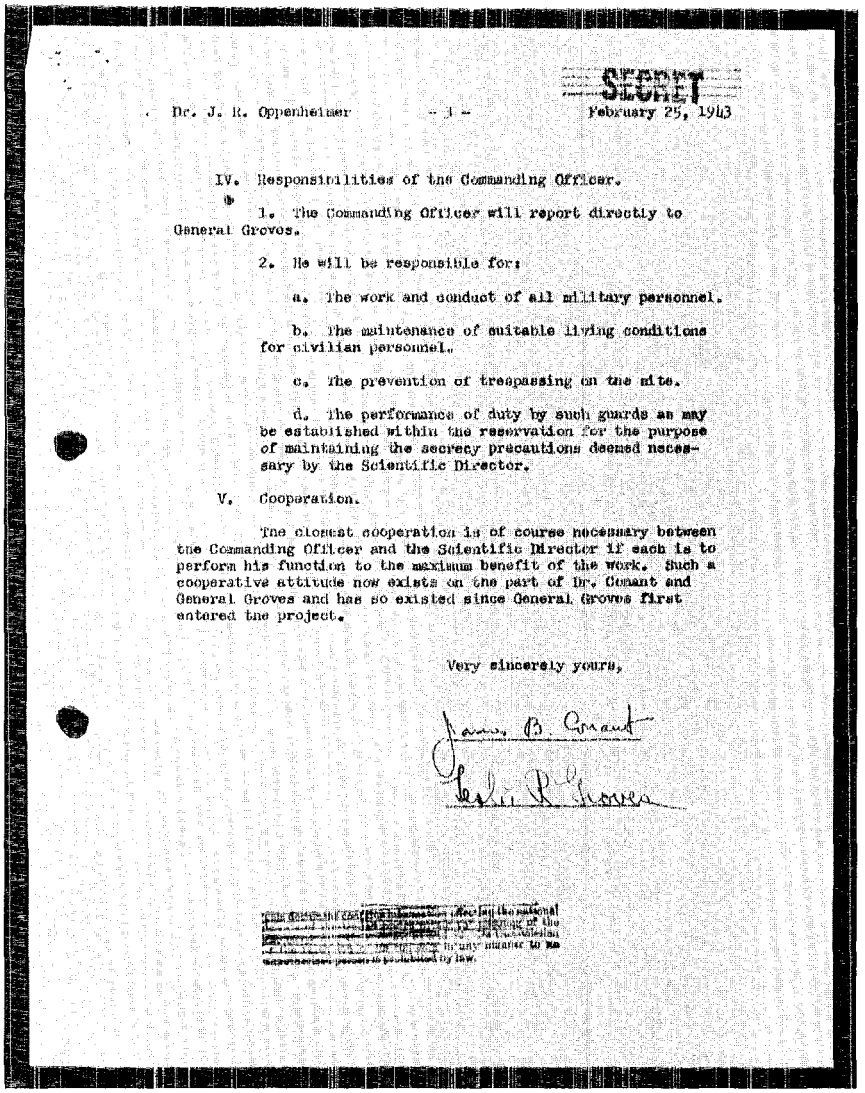
3. He will keep Dr. James B. Conant and General Groves informed to such extent as is necessary for them to carry on the work which falls in their respective spheres. Dr. Conant will be available at any time for consultation on general scientific problems as well as to assist in the determination of definite scientific policies and research programs. Through Dr. Conant complete access to the scientific world is guaranteed.

Time was that almost all correspondence, reports and other information pertaining to the Los Alamos Scientific Laboratory was shrouded with secrecy. Then known as Project Y, the Laboratory was part of the Manhattan Engineer District and was secretly engaged in the development and fabrication of the world's first atomic bomb.

Most of the documents generated during this period in LASL history remained in their classified states for many years, and they were joined by a multitude of others whose disclosure was considered to be detrimental to national security at the times they were classified. The bulk of recent and present information on the Laboratory's weapons work remains closely protected.

The passage of time, however, has a curious way of degrading

—from 'Year One'



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IV. Responsibilities of the Commanding Officer.

1. The Commanding Officer will report directly to General Groves.

2. He will be responsible for:

a. The work and conduct of all military personnel.

b. The maintenance of suitable living conditions for civilian personnel.

c. The prevention of trespassing on the site.

d. The performance of duty by such guards as may be established within the reservation for the purpose of maintaining the secrecy precautions deemed necessary by the Scientific Director.

V. Cooperation.

The closest cooperation is of course necessary between the Commanding Officer and the Scientific Director if each is to perform his function to the maximum benefit of the work. Such a cooperative attitude now exists on the part of Dr. Conant and General Groves and has so existed since General Groves first entered the project.

Very sincerely yours,

Jas. B. Conant

Leslie R. Groves

Pages two and three of the document, which begins on the cover, has been declassified and marked as being of historical interest. There is some speculation that the document may have been confirmation of Robert Oppenheimer's appointment as director of the Laboratory.

what was once considered important, and documents are no exception. A team of reviewers, assembled by the Atomic Energy Commission's Division of Classification, recently spent five weeks scrutinizing the contents of 321,159 documents at LASL and stripping the classified markings from 166,910.

Similar reviews have been conducted at other AEC laboratories and will eventually encompass classified records at all of the Commission's installations. These reviews are being conducted in accordance with Executive Order 11652. The essence of this order is to make as much information as possible, regarding the affairs of government, available to the public. Continuing, although somewhat relaxed, constraints are applied to Restricted and Formerly

continued on next page

A part of the review team is shown at the Records Management Center going through classified material, document by document. Seated at left is John McDonald, ISD-6 alternate group leader. Next to him is Melvin Neef, assistant director for operations for the Division of Classification, who led the review team.

Restricted Data, which are defined by the Atomic Energy Act as information "concerning the design, manufacture and utilization of nuclear weapons." All LASL holdings of information in these categories were reviewed in light of specific topics in classification guides issued —and periodically revised—by the Division of Classification.

In addition, the executive order allows for the systematic downgrading of National Security Information—information not defined as being either Restricted or Formerly Restricted Data—in accordance with a precise time schedule. It applies not only to National Security Information classified since the inception of Executive Order 11652, but to all NSI holdings. "Top Secret" information is automatically downgraded to "Secret" after two years. "Secret" material becomes "Confidential" after two years, and "Confidential" documents are declassified after six years. There are some exceptions, one of which concerns classified information entrusted to the United States by a foreign country.

"The team at LASL was composed of 70 people, representing 22 organizations from throughout the

Members of ISD-5 who provided the necessary clerical support for reviewers at the Records Management Center included Billy Trujillo, Janet Coffey and Wanda Maes.

Reviewing documents in the Report Library, foreground, are Morris Shalka, AEC Headquarters; Doris Dunning, ISD-6; Betty Gosnell, AEC Headquarters; Richard Johnston, AEC Nevada Operations Office; and Roger Dildine, ISD-6. In background are Ignazio Cucchiara, AEC Headquarters; Paul Dowd, Monsanto Mound Laboratory; Herbert Zuhr, General Electric Co., and Lawrence Mickener, Oakridge National Laboratory.

weapons complex, who served for periods of from one to three weeks," said John McDonald, alternate ISD-6 group leader. "They represented a broad spectrum of talent and, more importantly, memory. They were not necessarily classification officers, but they were people who have been working on the fringes of the classification program for a long time. So, they are aware of classification criteria published by the Division of Classification.

"They went from 'year one,' in correspondence files that estab-

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Art Freed, ISD-4 group leader, and Antonia Mascarenas discuss the disposition of a file in the report library. At typewriter is Jean Balagna. In background, Felicia Winn, Pat Max and Viola Salazar file reports examined by the AEC review team.

lished the Laboratory in the early 1940's and reported work and activities of the Manhattan Engineer District, to about 1946, and they went through other files from 1946, when the Laboratory came under the AEC, until 1965. These were the years that would produce the greatest volume of material for declassification.

"The reviewers were led by Melvin Neef, assistant director for operations for the Division of Classification, and they were split between the Records Management Center and the Report Library. At the Center, they went through boxes of files, document by document. They made a decision on each one as to whether or not it could be declassified. The decision was either yes or no. There was no attempt made to downgrade. If the material could not be declassified, the reviewers left it in the classification category in which they found it. The reviewers also flagged documents they believed would be of historical interest."

Members of the ISD-6 classification staff alternated between normal classification duties and serving as members of the review team. Other LASL groups involved were ISD-5 and ISD-4.

"Our group was responsible for logistics at the Center," said Walt Bramlett, ISD-5. "We arranged for lighting, desks and chairs for the reviewers; we segregated unclassified from classified records so reviewers wouldn't have to waste time by going over documents that were already unclassified; we physically furnished boxes of documents for the reviewers, and we provided the clerical help necessary to record their actions.

"The reviewers went through about 800 cubic feet of records at the Center, which included 299,000 classified documents." Of these, Bramlett reported, 158,275 were declassified.

At the Report Library, members of Art Freed's group, ISD-4, isolated AEC classified reports and provided the clerical services required by the reviewers. Freed noted that the team reviewed 22,159 reports. Of these, 8,645 were declassified.

A computerized listing of all the documents declassified during the review at the Records Management Center will be prepared by ISD-5 and AO-7. This listing will be circulated among all other AEC installations so that duplicate copies can also be declassified. Declassification actions taken in the Report Library will be transmitted to the AEC by ISD-4. Other organizations having duplicate reports will be notified so that their copies can also be declassified.

In addition to making the declassified information more readily available to the public, there are administrative advantages resulting from the project. First of all, there are some savings in manpower in that accountability requirements for the maintenance and disposal of unclassified materials are considerably less stringent than those for classified documents. Some of the documents, particularly those that were singled out as being of historical value, may be transferred to the National Archives where officials have already indicated an interest in such a transfer. According to Bramlett, there is no immediate reduction in space requirements at the Center for records storage, although there may be if some documents are sent to the National Archives. In the Report Library, Freed stated, "File space ought to be gained since records about unclassified reports take less space than those for classified ones . . . and we have had crowding of such files."

Q-Division Formed to Concentrate Energy-Related R&D

A new division—known as Q-Division—has been formed to concentrate all energy-related research and development at the Los Alamos Scientific Laboratory, according to LASL Director Harold Agnew.

"During the past few years, several innovative energy-related programs have been supported in various Laboratory divisions," the director said. "Now that the national need for increased research and development in the areas of energy production and energy conservation is becoming more apparent, I believe it is time to concentrate our energy-related efforts under a single management. LASL's strong multidisciplinary scientific staff and the proximity of the Valles Caldera, which can become an outdoor laboratory for geothermal research, are among the many positive factors which make LASL well suited for energy research and make likely important LASL contributions toward solving some of our national energy problems."

Members of the new division include personnel presently working on controlled thermonuclear research, geothermal energy, cryogenics applications such as superconducting electrical power transmission and energy storage, and the subterrene project. A systems studies activity concerned with technical assessment and implications of the relationship of energy production systems to ecological systems, as well as with the economic and social aspects of energy problems is an important part of the division.

Robert Duffield, who was a member of the Manhattan Project at Los Alamos during World War II and who recently resigned as director of the Argonne National Laboratory, is Q-Division leader. Other senior members of the division office include Fred Ribe, who is directing controlled thermonuclear research, and Edward Hammel and Roderick Spence, who jointly supervise the non-nuclear and applied technology programs of the new division with specialized direction in the geosciences from Orson Anderson of the University of California at Los Angeles.

Robert Duffield

Fred Ribe

Edward Hammel

Roderick Spence

Duffield received the B.A. degree from Princeton University in 1940 and the Ph.D. degree in chemistry from the University of California at Berkeley in 1943. He began his career in 1943 at Los Alamos, where he remained until he joined the University of Illinois in 1946. He was an associate professor when he left Illinois in 1956 to join the John Jay Hopkins Laboratory of the General Atomic Division of General Dynamics Corporation (Now Gulf General Atomic) in San Diego, Calif. At General Atomic, Duffield was in charge of development of the TRIGA research reactor, and was also responsible for the development by General Atomic of the high-temperature, gas-cooled power reactor which is used by the Philadelphia Electric Company at Peach Bottom, Pa. He was assistant director of the John Jay Hopkins Laboratory when he was named director of Argonne National Laboratory in 1967.

Ribe has been employed at LASL since 1951. He has been associated for many years with the Laboratory's work in controlled thermonuclear research and is presently alternate P-Division leader for controlled thermonuclear research.

Hammel, a LASL employee since 1944, has an international reputation in low-temperature physics and cryogenic engineering. He was leader of LASL's cryogenics group for many years.

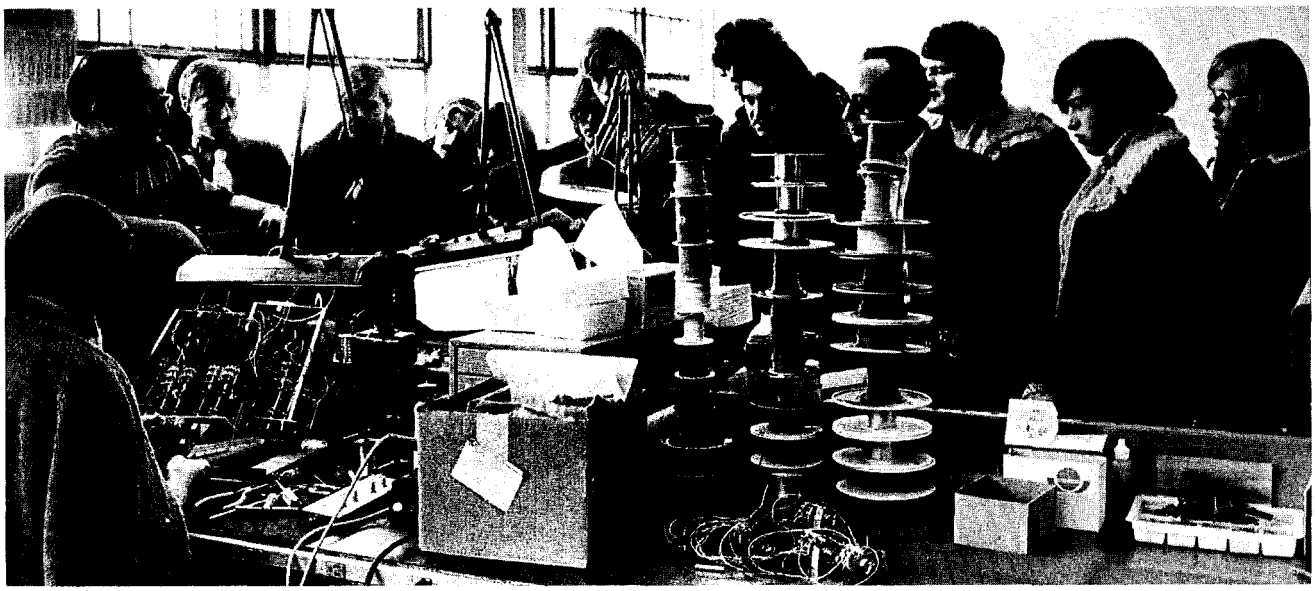
Spence, a member of the LASL staff for 28 years and N-Division leader since 1962, will join Q-Division upon the dissolution of N-Division on or about June 30.

Anderson is professor of geophysics and planetary physics at UCLA. His career includes nine years on the staff of Bell Laboratories in New Jersey, three years as manager of the Materials Department of American Standard Company, and eight years on the faculty and staff of the Lamont Geological Observatory of Columbia University.

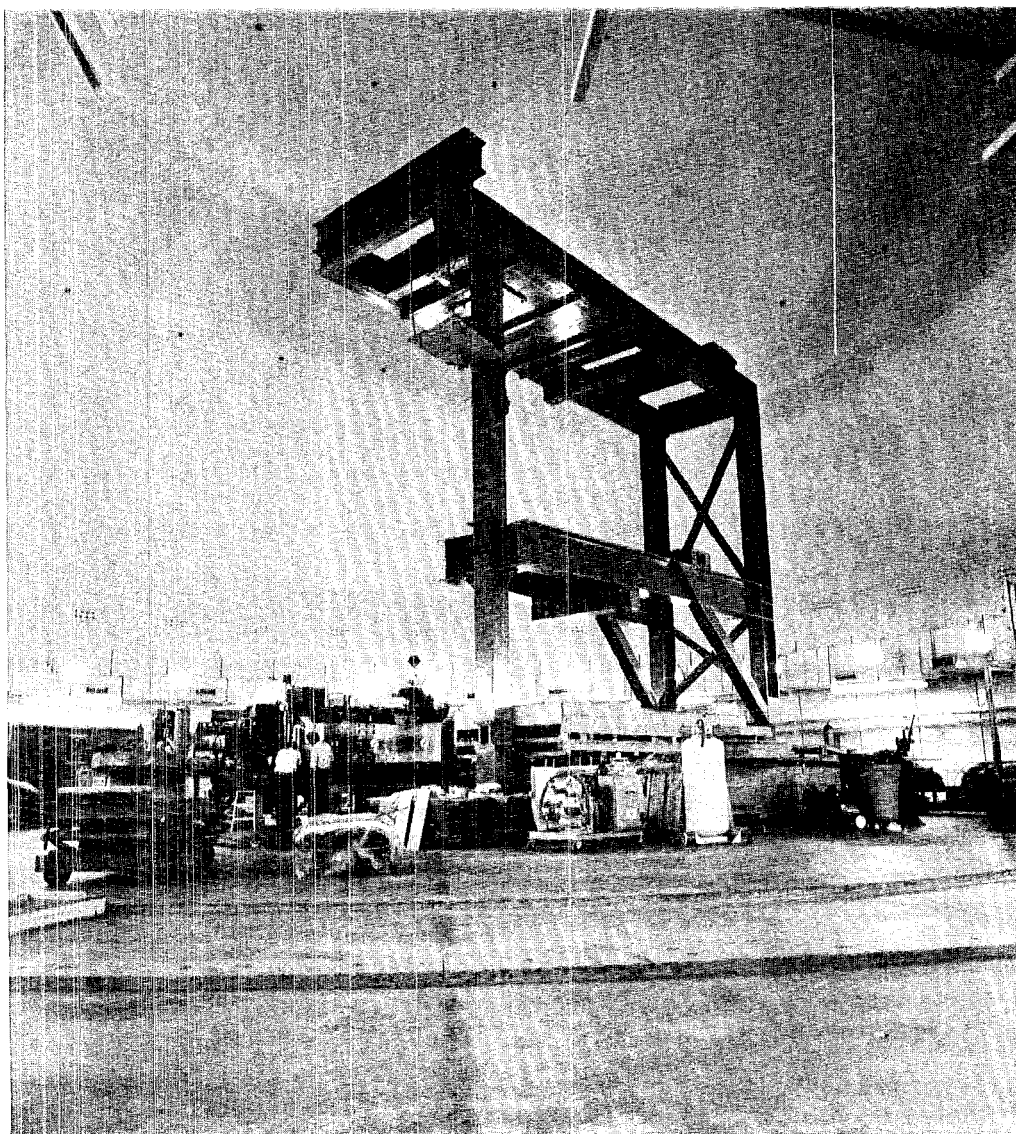
Photo Shorts

by Bill Jack Rodgers and Henry Ortega

Above, Robert Gibney, CMB-13 group leader, displays a replica of an experimental model of the first transistor. It was sent to Gibney by Bell Laboratories which is observing the 25th anniversary of the development of the Nobel-Prize-winning transistor. Gibney was a member of the team which did experimental work in connection with its development. Left, Dick Bohl, ADWP-1, accompanied Harold Chestnut, president of the Institute of Electrical and Electronics Engineers, and Cecil Land, past president of the Institute's Albuquerque chapter, during a tour of the Bradbury Science Hall. Tour guide was Bob Brashear, with hand raised, assistant ISD-2 group leader. Below, industrial electronics students from the Santa Fe Technical Vocational Institute toured the Group E-2 Fabrication Shop. Explaining shop operations was Iraj Bijarchi, left.



Five 75-ton capacitor banks, used at LASL in connection with efforts to develop the experimental, controlled-thermonuclear-reaction device, Scyllac, were moved intact on air pallets. According to George Sawyer, P-15 group leader, the capacitor banks were moved four feet to make room for the installation of 10 more similar units, required to complete the eight-meter Scyllac torus. The five capacitor banks are expected to be operational again in April.



Framework for the High-Resolution Proton Spectrometer in Area C of the Clinton P. Anderson Los Alamos Meson Physics Facility, rises high above the floor where scientists are assembling the first of the spectrometer's huge magnets. The 130-ton magnet is one of two that will be housed in the framework.

Mineral-Insulated Cables for Electromagnets in High Radiation Fields

Alex Harvey displays cross sections of *hollow and solid mineral-insulated* cables.

Steering, focusing and bending magnets, in various states of completion, cover the floor of Experimental Area A at the Clinton P. Anderson Los Alamos Meson Physics Facility. Mineral-insulated magnets are being assembled *in right foreground.*

One of the knottiest problems confronting scientists charged with accelerator-beam handling at the Clinton P. Anderson Los Alamos Meson Physics Facility has been to make an electromagnet that can live in the high radiation fields anticipated in the facility's switchyard and experimental areas.

More specifically, the radiation tolerances of electrical insulating materials, traditionally used to cover the copper windings of beam steering, bending and focusing magnets, are too low to withstand the anticipated high radiation arising from the intensity of the beam at the meson facility.

Intensity, the number of particles produced by an accelerator as a function of time, is one of the most significant characteristics of the Los Alamos Scientific Laboratory's meson facility. Its intensity of one milliampere, or 6,000,000,000,000,000 particles per second, is greater than any other particle accelerator in the world.

While this feature will allow scientists to explore the atom much more extensively than can be done with less intense beams of particles, radiation levels are substantially higher. In these radiation environments, the conventional organic materials used to insulate magnet windings would be likely to char. To avoid the possibility of charring and subsequent magnet failure, Los Alamos scientists have developed some suitable radiation-resistant cables.

The Los Alamos scientists have developed both solid- and hollow-conductor cables that are insulated with magnesium-oxide powder, an inorganic material that is called mineral insulation by the wire and cable industry. The magnesium oxide is held around the conductor by a copper sheath.

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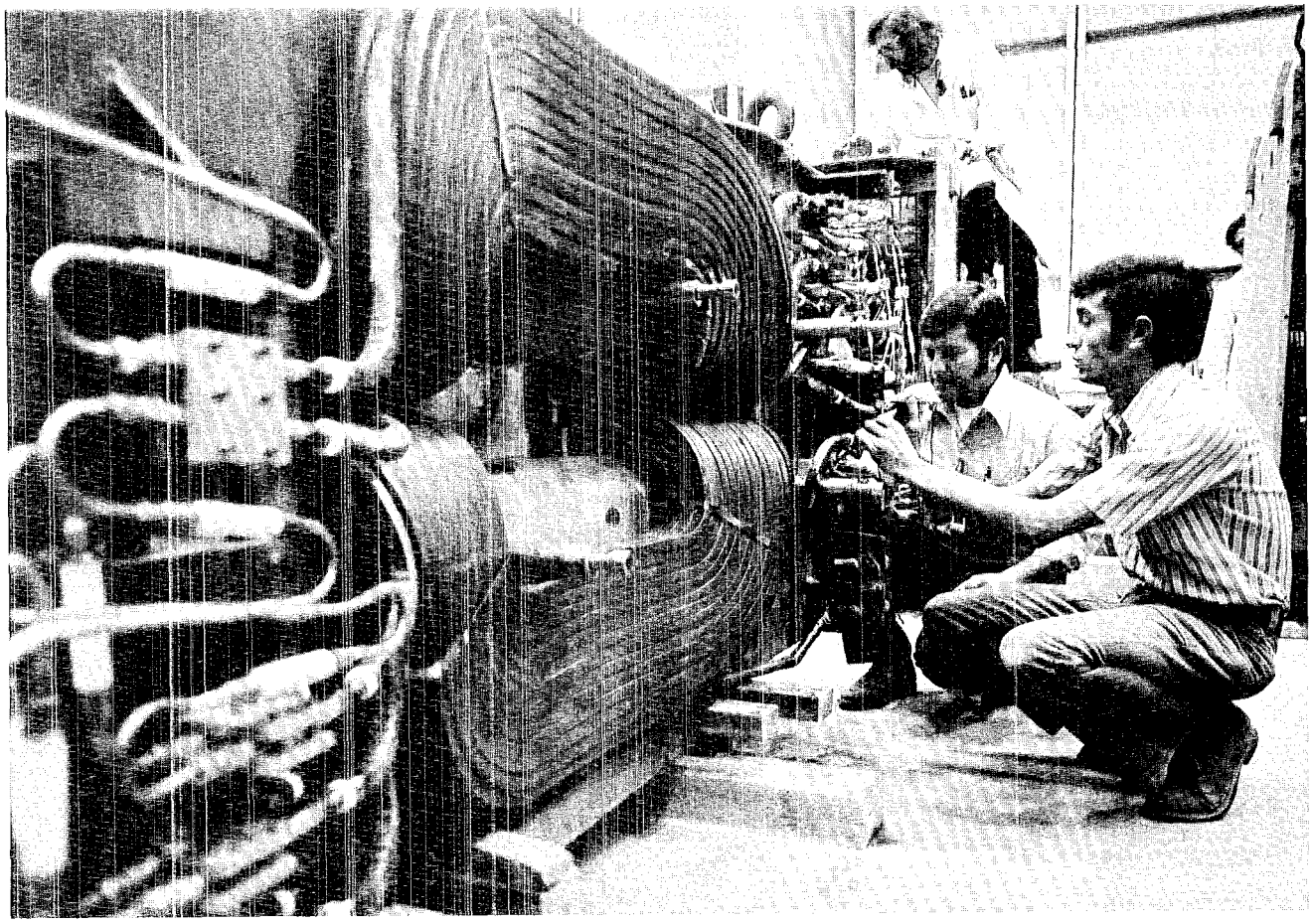
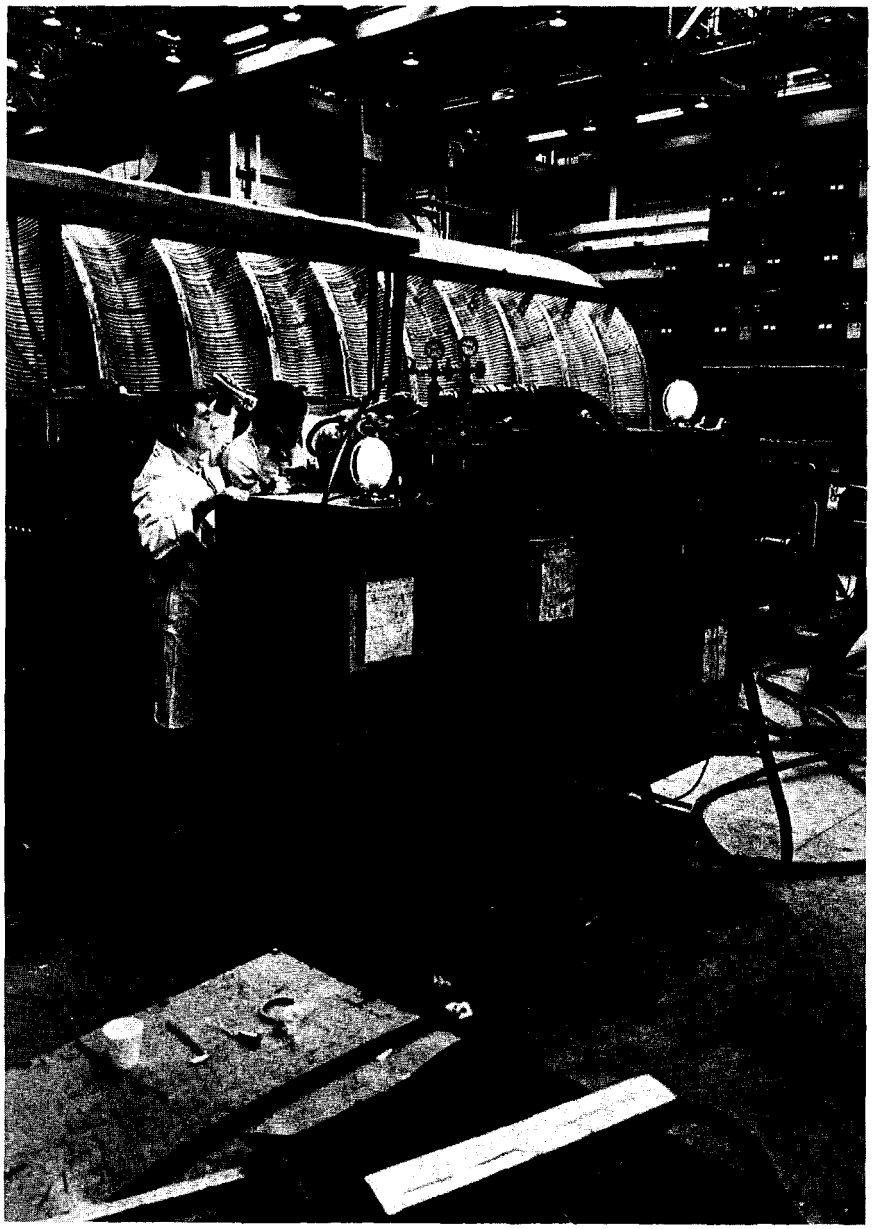


Ted Montoya and Freddy Roybal test an interlock switch on a large bending magnet that is being assembled for the low energy pion channel. In background is Dan McDonnell.

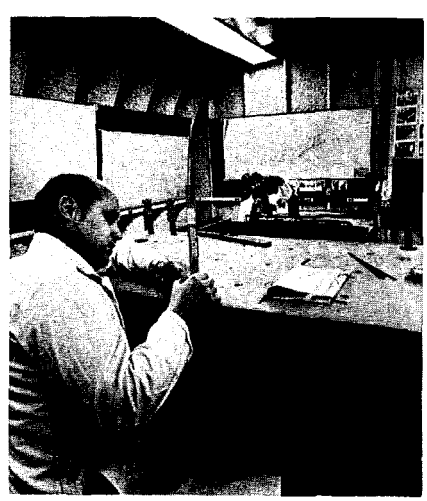


Lon Martinez and Montoya make the electrical connections on a large focusing magnet whose performance will be thoroughly tested before being put into service in the accelerator's main beam line. This magnet is categorized as a "triplet" because it consists of three joined magnets. It is designed to focus accelerated particles in the much the same way that a multi-element camera lens focuses light.

According to Alex Harvey, MP-6, "Solid-conductor cable has been used exclusively in the beam switchyard where the magnets have low magnetic fields. The mineral-insulated coils are cooled by water circulating in copper tubing attached to the coils by soft solder. Thus, the water never is in contact with the electrical conductor. In the main experimental area, much more powerful magnets are needed, requiring higher currents in the coils. Hollow conductors are used here. Cooling water flows through the holes in the conductors. This, in turn, means that insulators have to be put in all the water connections."

Harvey, who is responsible for mineral-insulated magnets at the meson facility, noted that mineral-insulated copper conductors were primarily developed to withstand high temperatures and have been used accordingly aboard naval vessels and at nuclear reactor stations. But, they have never before been used in beam-handling magnets in high radiation fields such as will be encountered at the meson facility.

"There are only two plants in North America that make mineral-insulated cable," said Harvey. "The cables they produce are normally round. What we had to do was to persuade them to make square cables and to put a hole in some of them. Making them square is a minor production problem for them. But, for our purpose, square cable packs together better when it's coiled. The hollow-conductor cable, however, did mean a rather significant change in their usual manufacturing process."



MP-6 involvement in mineral-insulated magnets is supported by members of MP-8 whose work in this area includes alignment of magnet bores on doublets and triplets. Aligning a doublet are Ed Weiler and Gus Roybal, both of MP-8.

short subjects

William Stratton, N-2, has been elected vice-chairman of the Atomic Energy Commission's Advisory Committee on Reactor Safeguards (ACRS) for calendar year 1973.

The ACRS advises the AEC on the safety aspects of proposed and existing nuclear facilities and the adequacy of proposed reactor safety standards.

Stratton, a physicist, has had more than 20 years experience in nuclear physics, theoretical nuclear weapons design, criticality safety and evaluation of reactor safety and development problems. He has been a member of the ACRS since 1966.

Charles Campbell, assistant manager for logistics at the Atomic Energy Commission's Albuquerque Operations Office and former manager of the Commission's Los Alamos Area Office, has retired after 31 years of federal service.

Campbell was responsible for various assignments in the personnel and labor relations fields at Los Alamos and Albuquerque from 1945 to 1952 and managed the Los Alamos Area Office from 1962 to 1967.

Phyllis Heyman, an employee of Group C-1 when she retired in 1971, died. She is survived by her husband, Henry of Pojoaque, and two sons, Victor and Barton.

Jacqueline King, secretary of former LASL Director Norris Bradbury, died at her home in Pojoaque following a lengthy illness. She is survived by her husband, L. D. P. King, and one son, James Cyzmoure, Frankfurt, Germany.

Herbert Hutcheson, SP-4, died at the Los Alamos Medical Center. He is survived by his wife, Thelma, and two daughters, Carole, Lubbock, Texas, and Joanne Sherwood, Wellington, Texas.

John Alexander, SP-3, died at the Los Alamos Medical Center. He is survived by his daughter, Anne Fern, Albuquerque.

James McNally, Albino Program manager at the Los Alamos Scientific Laboratory, is serving as the U.S. delegation's technical representative at the Spring Session of the Geneva Conference of the Committee on Disarmament. **John Puckett,** assistant to the associate director for weapons, has assumed Albino management duties during McNally's absence.

The Committee on Disarmament considers such issues as nuclear, biological and chemical warfare. As part of its task, the committee handles negotiations on nuclear test bans.

McNally served in a similar capacity in 1969 during the negotiation of the Treaty Prohibiting the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea Bed and Ocean Floor. In 1972, **John Hopkins,** assistant J-Division leader for NTS testing, provided technical representation for the U.S. delegation on the Committee on Disarmament.

Bernice Kelly, T-DO, retired after more than 27 years with the Laboratory. She will live in Sandy, Utah.

Walter Sanborn, SP-12 group leader, retired after 27 years as an employee of the University of California. He was a buyer for the Los Angeles Office in 1946. He transferred to SP-12 at LASL as a buyer supervisor in 1965. Later that year he became SP-12 group leader. He and his wife, Harriet, will move to Laguna Hills, Calif.

Robert Phelps retired after 20 years with Group CMB-1. Phelps and his wife, Grace, will remain in Los Alamos.

continued on next page

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A Course in Value Engineering

"Value engineering" is a stock phrase that in the simplest terms means "getting the most for your money." It consists of a systematic method for stimulating creative thinking aimed at cutting costs and at the same time improving reliability and performance.

The system has been devised in such a way that it can be used in a wide range of applications from building junk shelves in the family garage to defining more efficient office procedures to improving the design of complex apparatus.

The method, also known as "value analysis," has been used successfully for many years by manufacturers of automobiles, appliances and electronics, and by other industrial concerns which mass produce competitive innovations for sale to the public.

Value engineering came to Los Alamos two years ago in the form of an intensive training course taught by Jack Heuter of the Sandia Corporation's Educational Division. Heuter, who has taught the course to about 1,000 persons at various Atomic Energy Commission installations since 1963, recently gave his second presentation at LASL.

The 12 Laboratory participants in the course, sponsored by the Supply and Property Department, actually value-engineered three current LASL projects—a review of an instrument contract with emphasis on the flow of documentation, submitted for consideration by the Supply and Property Department; the design of a liquid-target vacuum chamber, the Zia Company; and a test bed for superconducting power-transmission studies, P-Division.

To engineer the three projects, the participants were divided into three teams. Each team was assign-

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Dean Meyer, H-1 group leader, and **Harold O'Brien,** CNC-11, have been appointed by Governor Bruce King to serve on the New Mexico Radiation Technical Advisory Council.

Meyer will serve a five-year term. O'Brien will complete three years of the unexpired term of **L. M. Holland,** H-4, who resigned from the council after being elected to the Los Alamos County Commission.

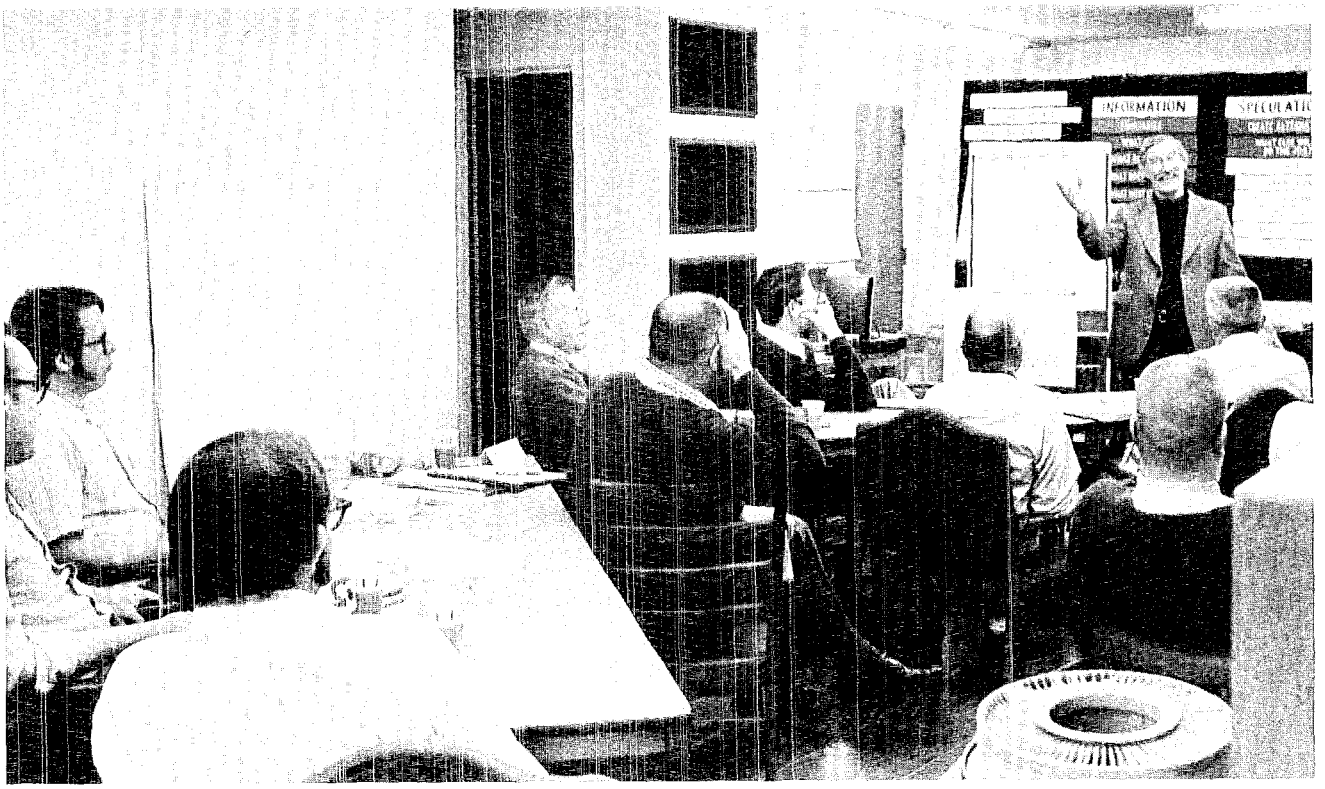
The Council, whose chairman for calendar year 1973 is **Dr. Paul Lee** of Los Alamos, advises the New Mexico Environmental Improvement Agency and the Environmental Improvement Board on technical matters relating to radiation. With the advise and consent of the council, the Environmental Improvement Board is authorized to promulgate rules and regulations concerning the health and environmental aspects of radioactive materials and radiation equipment.

Steve Stoddard, CMB-6 Ceramics Section leader, has been re-elected treasurer of the American Ceramic Society.

The American Ceramic Society is broadly educational. It makes recommendations and proposals for courses in ceramics and sponsors student branches. For scientists, engineers and plant operators, it provides continuing education through Society-sponsored division and section meetings, an annual meeting and publications.

William Lyons, associate L-5 group leader, will begin a two-year leave of absence March 15, to serve in the office of the Assistant Secretary of Defense for Intelligence.

Lyons will serve as an advisor in connection with the second round of the Strategic Arms Limitation Talks (SALT) and in the assessment of other related strategic problems.



Value-Engineering Instructor Jack Heuter, of the Sandia Corporation's Educational Division, supplemented the course with slide presentation, photo at left, and numerous other visual aids, above. There were 12 class participants from the Los Alamos Scientific Laboratory.

ed to one of the LASL projects and told to proceed with the value engineering concept via a precise sequence of activities known as the Job Plan.

The first activity in the sequence is called the Information Phase. All information concerning the project is secured, including requirements, processes and materials. Each part of the project is questioned to determine its validity and contribution. The basic function of the project is identified and segregated from all secondary or supporting functions and an effort is made to determine if the basic function is indeed required. If so, secondary and supporting functions are considered for elimination or combination.

This is followed by the Speculation Phase, during which the team members consider the question, "What else will do the job?" Heuter encouraged the participants to ". . . think far out. Make your ideas as wild as possible. Have a good time and don't give any thought to being called a fool. Modify and build on the ideas of other members of your team."

Subsequently, in the Analysis Phase, suggestions are recorded and evaluated for feasibility to provide the project's required basic function. No idea is abandoned without valid justification.

This is followed by the Development Phase. The best ideas are completely developed, and costs, testing and implementation requirements are documented.

Finally, in the Report Phase, a complete factual and impartial written presentation is prepared to "sell" the team's recommendations to the responsible project engineer or operation supervisor.

"We think that the value engineering concept can be applied at the Laboratory," said Roger Ganger, SP-DO, who coordinated local arrangements for the course presentation, "although there are more applications for it in places where products are mass produced. The Laboratory's work is in the area of research, development and testing, and many times only a single item is required for a one-shot operation. There may not be time to value engineer cases like these or the value may not be great enough to warrant it."

Ganger noted that some items fabricated in multiples at the Laboratory and some costly "singles" may warrant application of the value engineering concept. "We don't know yet whether the course is going to be an annual event. What we hope to accomplish is an understanding and application of the value engineering technique in order to develop a better product at less cost during conception through the operational phases."

the technical side

Taken from LASL Technical Information Reports submitted through ISD-6

Colloquium, Department of Physics and Astronomy, University of Kansas, Lawrence, Nov. 6:

"Stopped Muons — A Nuclear Probe" by J. J. Malanify, A-1

Nuclear Seminar, Department of Physics and Astronomy, University of Kansas, Lawrence, Nov 7:

"Isotopic Carbon Analysis with Low Energy Protons" by J. J. Malanify, A-1

Twenty-Fifth Annual Meeting, American Physical Society, Division of Fluid Dynamics, Boulder, Colo., Nov. 20-22:

"Evidence for a Phase Transition in Kel-F (Polychlorotrifluoroethylene) Under Shock Loading" by J. O. Johnson and P. M. Halleck, both WX-7

"Reflected-Shock Hugoniot for Liquid Argon between 0.26 and 0.74 Megabars" by W. L. Seitz and J. D. Wackerle, both WX-7

"Pressure Observations on the Shock-Induced Decomposition of 1.75 g/cm^3 PETN" by J. D. Wackerle and J. O. Johnson, both WX-7

"Some Hugoniot Data for Liquid Deuterium and Hydrogen" by R. D. Dick, M-4

"Hugoniot Curves for Several Substituted Methane Liquids" by R. H. Warnes and R. D. Dick, both M-4

"A Study of Shocks, Release Waves and the Hugoniot Elastic Limit of Boron Carbide using the Axially Symmetric Magnetic Probe" by J. N. Fretz and J. A. Morgan, both M-6

"Geothermal Resources Created by Hydraulic Fracturing in Hot Dry Rock" by R. M. Potter, CNC-4 (invited)

"Structure and Brightness of Strong Shock Waves in Air" by J. Zinn and R. C. Anderson, both J-10

"Acoustic Ray Tracing in Unsteady Flows" by R. Engelke, M-3

"Numerical Calculation of Transient Flows of Chemically Reacting Mixtures in Two Dimensions" by W. C. Rivard, T. D. Butler and O. A. Farmer, all T-3

Nuclear Physics Seminar, Florida State University, Tallahassee, Nov. 20:

"Stopped Muons — A Nuclear Probe" by C. J. Umbarger, A-1

"Sensitivity and Detectability Limits for Elemental Analysis by Proton-Induced X-Ray Fluorescence with a 3-MV Van de Graaff" by C. J. Umbarger, A-1

Physics and Astronomy Seminar, University of Maryland, College Park, Nov. 27:

"The Thermal State of the Interplanetary Medium at 1 AU" by W. C. Feldman, P-4 (invited)

Inventory of Religious Art Conference, Santa Fe, Nov. 28:

"The Potential Application of Isotopic Labels for Identification of Art Objects" by G. A. Cowan, CNC-DO

Eighteenth Annual Conference on Magnetism and Magnetic Materials, Denver, Colo., Nov. 28—Dec. 1:

"Magnetic Properties of Holmium-Silver" by N. G. Nereson, P-2

"Magnetic Properties of Manganese- Diboride" by N. G. Nereson, P-2, A. L. Bowman, CMB-3, and G. Arnold, L-3

American Society of Mechanical Engineer's Annual Winter Meeting, New York, N. Y., Nov. 29:

"An Innovative Approach to an Ancient and Honorable Problem—The Rock Melting Concept" by R. J. Hanold, N-7

National Meeting on Applications of Optical Instruments in Medicine, Chicago, Ill., Nov. 29-30:

"Visualization of Pion Stopping Region" by P. N. Dean, H-4 (invited)

American Institute of Aeronautics and Astronautics—Society of Automotive Engineers Eighth Propulsion Joint Specialists Conference, New Orleans, La., Nov. 29-Dec. 1:

"The Design of a Nuclear Rocket Engine for Advanced Unmanned Missions" by F. P. Durham and W. L. Kirk, both N-DO

"Mission Performance of a 360-Mw Nuclear Rocket Engine" by J. D. Balcomb, N-DO

"The Nuclear Rocket Energy Center Concept" by J. H. Altseimer and L. A. Booth, both N-DOT

Symposium on Recent Developments in Research Methods and Instrumentation, National Heart and Lung Institute, National Institutes of Health, Bethesda, Md., Nov. 30:

"Electronic Cell Sorting and Applications to Cell Biology and Exfoliative Cytology" by M. A. Van Dilla and J. A. Steinkamp, both H-4 (invited)

International Atomic Energy Agency Specialists' Meeting on Application of Reliability Analysis to Control and Instrumentation Systems, Kjeller, Norway, Nov. 30-Dec. 1:

"An On-Line Diagnostic Technique to Improve Instrumentation System Availability" by H. H. Helmick, N-2

Seminar, Georgia Institute of Technology, Atlanta, Nov. 30:

"The Nuclear Chemistry Program at the Los Alamos Meson Physics Facility" by B. J. Dropesky, CNC-11

Chemistry Seminar, The Colorado College, Colorado Springs, Nov. 30:

"^{244}Pu as a Possible Indicator of Interstellar Dust within the Solar System" by G. A. Cowan, CNC-DO

Seminar, Department of Physics, Texas Technological University, Lubbock, Nov. 30:

"The Pion as a Nuclear Probe" by W. R. Gibbs, T-5

Atomic Energy Commission "In-House" Conference on Thermodynamics, Rocky Flats Division of Dow Chemical Company, Golden, Colo., Dec. 4-5:

"Experimental Assessment of Electrode Equilibriums in High Temperature Fused Salts" by G. M. Campbell, CMB-11

"Problems of Extrapolating Measurements to Very High Temperatures" by E. K. Storms, CMB-3

"Pitfalls of Insufficient Processing Prior to Low Temperature Heat Capacity Measurements on Actinide Materials" by T. A. Sandenaw, CMB-13

"Oxygen Bomb Combustion Calorimetry of Carbides" by E. J. Huber, Jr., and C. E. Holley, Jr., both CNC-2

"Calorimetric Activities in Group CNC-2, Los Alamos" by C. E. Holley, Jr., CNC-2

"Solution Activity Equations for Molten Alloy 'Fine Structures'" by G. R. B. Elliott, CNC-2

"Calculation of the Equilibrium Compositions for Multi-Constituent Systems" by R. C. Feber and J. W. Starner, both CMB-8, and C. C. Herrick, CMB-13

1972 Institute of Electrical and Electronics Engineers International Electron Devices Meeting, Washington, D.C., Dec. 4-6:

"The Fluid Dynamics of Continuous Wave Chemical Lasers" by T. D. Butler, O. A. Farmer and W. C. Rivard, all T-3

"A High Energy Pulsed HF Laser" by R. G. Wenzel and G. P. Arnold, both L-3

"Predicting the Rieke Diagram of the High-Power Klystron" by P. J. Tallerico and R. L. Cady, both MP-8, and R. A. Jameson, MP-9

American Geophysical Union Annual Fall Meeting, San Francisco, Calif., Dec. 4-7:

"An Empirical Closure Relation for the Vlasov Moment Equations" by J. R. Asbridge, S. J. Bame, W. C. Feldman, all P-4, and H. R. Lewis, Jr, P-18

"Modifications of the Upstream Electron Thermal Properties Due to the Proximity of the Earth's Bow Shock" by S. J. Bame, J. R. Asbridge, W. C. Feldman and M. D. Montgomery, all P-4

"The Contribution to Solar Wind Proton Anistropy from Bulk Velocity Inhomogeneities" by W. C. Feldman, J. R. Asbridge and S. J. Bame, all P-4

"The Microstructure of the Earth's Bow Shock" by D. W. Forslund and J. M. Kindel, both T-6, and E. L. Lindman, J-10

"Current Driven Electromagnetic Ion Cyclotron Waves" by J. M. Kindel and D. W. Forslund, both T-6, and C. F. Kennel, University of California, Los Angeles

Atomic Energy Commission Headquarters, Washington, D.C., Dec. 5:

"Design of Albedo-Neutron Dosimeters" by D. E. Hankins, H-1

Seminars, Department of Physics, University of Wisconsin, Madison, Dec. 5, and Physics Division, Argonne National Laboratory, Ill., Dec. 7:

"Modified Analysis of p-^{3}He Elastic Scattering" by M. Bolsterli, T-9

National Research Council, Ottawa, Canada, Dec. 5:

"High Energy-Short Pulse CO_2 Laser System for Plasma Production" by C. A. Fenstermacher, L-1

1972 Fall Joint Computer Conference, American Federation of Information Processing Societies, Anaheim, Calif., Dec. 5-7:

"Computer Generated Optical Sound Tracks" by E. K. Tucker, ENG-7, L. H. Baker, Jr., TD-7, and D. C. Buckner, E-1

"Comments on Architecture Limitations in Large Scale Computation and Data Processing" by M. B. Wells, C-7

Applied Mechanics Colloquium, Sandia Laboratories, Albuquerque, Dec. 6:

"Spontaneous Ignition. Finite Element Solutions for Steady State and Transient Conditions" by C. A. Anderson, WX-3, and O. C. Zienkiewicz, University of Wales, Swansea

Department of Mechanical Engineering, University of California at Berkeley, Dec. 6:

"Nuclear Subterrene" by J. C. Rowley, N-7

Seminar, Department of Physics, University of Wisconsin, Madison, Dec. 6:

"Some Simple Strong Coupling Field Theory Models" by M. Bolsterli, T-9

Institute of Electrical and Electronics Engineers 1972 Nuclear Science Symposium, Miami Beach, Fla., Dec. 6-8:

"Some Medical Applications of Accelerators" by L. Rosen, MP-DO *(invited)*

"Contemporary Capacitive Energy Storage Systems" by E. L. Kemp, P-16

"Standard Software for CAMAC" by S. Dhawan, Yale University, New Haven, Conn., and R. F. Thomas, Jr., MP-1

"A Long Distance CAMAC Branch Via Data-Link and Microprogrammed Branch Driver" by L. R. Biswell, D. R. Machen, J. M. Potter, R. E. Rajala and R F. Thomas, Jr., all MP-1

American Chemical Society's 28th Annual Southwest Regional Meeting, Baton Rouge, La., Dec. 6-8:

"The Independence of Histone Phosphorylation from DNA Synthesis" by L. R. Gurley, R. A. Walters and R. A. Tobey, all H-4

"Nascent Messenger-Like RNA Metabolism in Chinese Hamster Ovary Cells Cultured at Elevated Temperature" by M. D. Enger and E. W. Campbell, both H-4

"The Effects of X-Irradiation on the Methylation of DNA from Chinese Hamster Ovary Cells" by R. A. Walters, R. L. Ratliff, L. R. Gurley and M. D. Enger, all H-4

Sigma Xi Chapter, University of Nevada, Las Vegas, Dec. 7:

"Random Packing" by W. M. Visscher, T-9

Berkeley Nuclear Laboratories, Berkeley, England, Dec. 7:

"Design of Albedo-Neutron Dosimeters" by D. E. Hankins, H-1

"The United States Atomic Energy Commission Workshop on Personnel Neutron Dosimetry" by D. E. Hankins, H-1

continued on next page

Science and Mathematics Colloquium, University of Nevada, Las Vegas, Dec. 8:

"Transport Coefficients in Simple Systems" by W. M. Visscher, T-9

Atomic Energy Commission and Atomic Energy Commission Contractor Health Protection Meeting, Puerto Rico Nuclear Center, San Juan, Dec. 8:

"Respirator Testing under New Management" by B. J. Held and E. C. Hyatt, both H-5 (invited)

Harwell Laboratories, Harwell, England, Dec. 8:

"Design of Albedo-Neutron Dosimeters" by D. E. Hankins, H-1

"The United States Atomic Energy Commission Workshop on Personnel Neutron Dosimetry" by D. E. Hankins, H-1

Student Section, American Nuclear Society, Albuquerque, Dec. 8:

"Geothermal Resources Created by Hydraulic Fracturing in Hot Dry Rock" by R. M. Potter, CNC-4 (invited)

International Atomic Energy Agency Symposium on Neutron Monitoring for Radiation Protection Purposes, Vienna, Austria, Dec. 11-15:

"A Passive, Broad-Energy Response, Neutron Spectrometer-Dosimeter" by H. V. Piltingsrud, Wright-Patterson Air Force Base, Ohio, and M. J. Engelke, H-1

"Design of Albedo-Neutron Dosimeters" by D. E. Hankins, T-1

"The United States Atomic Energy Commission Workshop on Personnel Neutron Dosimetry" by D. E. Hankins, H-1, and E. J. Vallario, Atomic Energy Commission, Washington, D.C.

Seminar, Laboratory of Nuclear Medicine, University of California, Los Angeles, Dec. 12:

"Biomedical Applications of Stable Isotopes of Carbon, Oxygen, and Nitrogen" by D. G. Ott, H-4 (invited)

Astrophysics Seminar, University of Illinois, Urbana, Dec. 13:

"Production of p-Process Nuclei during Explosive Carbon and Oxygen Burning" by W. M. Howard P-11

State University of New York, Stony Brook, Dec. 15:

"Chemical Kinetics in the H_2-F_2-O_2 System at the Second Explosion Limit" by J. H. Sullivan, CNC-4, R. Feber and J. Starner, both CMB-8 (invited)

Nuclear Research Center, Karlsruhe, Germany, Dec. 18; Institute for Reactor Studies, Wurenlingen Sweden, Dec. 20; and the Central Bureau for Nuclear Data, Geelfi, Belgium, Dec. 21:

"Design of Albedo-Neutron Dosimeters" by D. E. Hankins, H-1

"The United States Atomic Energy Commission Workshop on Personnel Neutron Dosimetry" by D. E. Hankins, H-1

American Physical Society Meeting, Los Angeles, Calif., Dec. 27-29:

"Microscopic Structure in ^{209}Bi from a Study of Isobaric Analog Resonance" by N. Stein, P-DOR (invited)

ISIS-II Satellite Experimenters Symposium, York University, Toronto, Canada, Jan. 3-5:

"Near-Earth Particles and Magnetotail Populations" by E. W. Hones, Jr., P-4 (invited)

"The Isotope Program at Los Alamos" by T. W. Whaley, H-4 (invited)

Seminar, Department of Biochemistry, University of Nebraska Medical School, Omaha, Jan. 4:

"Some Studies on RNA Polymerase in **Escherichia Coli**" by D. Smith, H-4 (invited)

Sixth Hawaii International Conference on System Sciences, Honolulu, Jan. 9-11:

"A Topological Processor to Determine the Presence of a Fragment in an Electrical Circuit" by J. L. Clark and R. W. Mitchell, both T-6

"Comparison of Different Filter Structures for Restoration of Images" by B. R. Hunt, C-5, and H. C. Andrews, University of Southern California, Los Angeles

American Astronomical Society's 139th Meeting, Las Cruces, N.M., Jan. 9-12:

"Non-Pulsating Stars in the RR Lyrae and Cepheid Instability Strips" by A. N. Cox and J. E. Tabor, both J-15, and D. S. King, University of New Mexico, Albuquerque

"On the Accuracy of the Thomas-Fermi Atom for Opacities" by L. D. Cloutman, T-3

"Two-Dimensional Implicit Radiation Hydrodynamics" by M. T. Sandford, II, J-10

"Airborne Video Recorded Coronal Emission Line Profiles of 5305A° at the 10 July 1972 Total Solar Eclipse" by D. H. Liebenberg, L-DOT, M. M. Hoffman and W. M. Sanders, both J-12, and J. M. Beckers, Sacramento Peak Observatory, Sunspot, N.M.

"Coronal Emission Line Profile Analysis from Airborne Eclipse Observations of 30 May 1965" by D. H. Liebenberg, L-DOT, R. Bessey and B. Watson, both University of Wyoming, Laramie

"Buoyancy of Supernova Remnants" by E. M. Jones, J-10

"The Superposition of Layers in Radiative Transfer" by H. A. Beebe and Reta F. Beebe, both New Mexico State University, Las Cruces, and H. G. Horak, J-10

"Non-Linear Pulsation of RR Lyrae Star Models" by W. H. Spangenberg, TD-3

"Polarization of the Outer Corona Based on Observations from a Jet Aircraft July 10, 1972" by C. F. Keller, J-15

"Airborne White Light Polarimetry of the Outer Corona during July 1972 Eclipse" by C. F. Keller, J-15

Fifth Miami Winter Symposia, University of Miami, Fla., Jan. 15-17:

"The Independence of Histone Phosphorylation from DNA Synthesis" by L. R. Gurley, R. A. Walters, and R. A. Tobey, all H-4

American Crystalographic Meeting, University of Florida, Gainesville, Jan. 15-18:

"A Refinement Technique for an Underdetermined Structure with Poor Data" by H. H. Cady, WX-2, and A. C. Larson, CMB-5

"Synthesis and Structural Characterization of some New Iron-Sulfur Cluster Compounds" by P. J. Vergamini, R. R. Ryan, and G. J. Kubas, all CNC-4

Seminar, University of Alberta, Edmonton, Canada, Jan. 16; University of Manitoba, Winnipeg, Canada, Jan. 17; and Colloquium, University of Saskatchewan, Saskatoon, Canada, Jan. 19:

"Conjectures on the Nature of Ball Lightning" by J. L. Tuck, P-CTR

University of Manitoba, Winnepeg, Canada, Jan. 17:

"Energy for Man's Future with Special Reference to Geothermal and Nuclear Energy" by J. L. Tuck, P-CTR

Seminar, Noble Foundation, Inc., Ardmore, Okla., Jan. 17:

"The Mammalian Cell Surface and the Role of Cell-Surface Heparan Sulfate" by P. M. Kraemer, H-4 (invited)

1973 Winter Simulation Conference, San Francisco, Calif., Jan. 17-19:

"An Application of Simulation to Debugging and Maintaining a Computer Network System" by M. W. Collins, C-2, and D. G. Harder, C-4

Seminar, Department of Pathology, University of Colorado Medical Center, Denver, Jan. 18:

"Mammalian Cell Synchronization: Techniques and Biochemical Studies" by R. A. Tobey, H-4 (invited)

Visiting Scientist Program, Lovington High School, N.M., Jan. 19:

"Plasma Physics, Fusion Reactors, and the Energy Crisis" by H. R. Lewis, P-18

Organic Seminar, Department of Chemistry, University of New Mexico, Albuquerque, Jan. 23:

"Syntheses with Stable Isotopes" by T. W. Whaley, H-4 (invited)

Colloquium, Engineering School, University of Wisconsin, Madison, Jan. 25:

"Efficient Computation of Multigroup Cross Sections" by P. D. Soran, T-2

Seminar, Division of Biology, University of Texas at Dallas, Jan. 25:

"Enzymatic Synthesis of Polynucleotides" by R. L. Ratliff, H-4 (invited)

Colloquium, Texas Tech University, Lubbock, Jan. 25:

"Muonic Atoms: Promise of a New Diagnostic Tool" by C. J. Umbarger, A-1

Rocky Mountain Academy of Occupational Medicine, Colorado Springs, Jan. 25-26:

"Plutonium in Man" by G. L. Voelz, H-DO

Greater Rio Grande Chapter, Association of Computing Machinery Winter Meeting, Sandia Laboratories, Albuquerque, Jan. 26:

"Programming by Semantic Refinement" by J. B. Morris, C-7

Eighth Mossbauer Methodology Symposium, New York, N.Y., Jan. 28:

"Direct Observation of Magnetic Order in 'Ferromagnetic Superconductors' by Means of the ^{57}Fe Mossbauer Effect" by D. J. Erickson and R. D. Taylor, both P-8, and C. E. Olsen, CMB-13

Division of Nuclear Chemistry and Technology, American Chemical Society Meeting, Newport Beach, Calif., Jan. 28-Feb. 1:

"A New Heavy Nuclide, ^{236}Th" by C. J. Orth, W. R. Daniels, and B. J. Dropesky, all CNC-11

"Prompt Neutrons from the Spontaneous Fission of ^{257}Fm" by Darlene C. Hoffman, J. P. Balagna, G. P. Ford, J. W. Wilhelmy, all CNC-11, J. A. Farrell, P-11, A. Hemmendinger and L. R. Veeser, both P-3

"A Test of Fission Fragment Angular Distribution Theory at Intermediate Energies" by V. E. Viola, Jr. and C. T. Roche, both University of Maryland, College Park, and M. M. Minor, P-2

American Physical Society Meeting, New York, N.Y., Jan. 29-Feb. 1:

"Short-Ranged Charge-Symmetry Breaking Effects in the 2^+ Doublet of ^{8}Be" by G. J. Stephenson, Jr., and B. F. Gibson, both T-5

"Asymmetry in π^+ Production by p-p Collisions at Medium Energies" by M. E. Schillaci, MP-3

"Longitudinal Polarization Transfer in the T(p, n)^{3}He Reaction from 4 to 15 MeV" by J. J. Jarmer, AWU Fellow in P-DOR, G. G. Ohlsen, J. E. Simmons and G. C. Salzman, all P-DOR

"Potential Applications of Stable Isotopes in Medicine" by G. A. Cowan, CNC-DO, and N. A. Matwiyoff, CNC-4 (invited)

"Levels in ^{124}Sb from the ^{123}Sb-(n, γ)^{124} Sb Reaction" by E. B. Shera, P-2

"Time Response of Plastic Scintillators" by P. B. Lyons, J-14, and J. Stevens, EG&G, Santa Barbara, Calif.

"Three-Nucleon Uncertainties Arising from Two-Nucleon Uncertainties" by B. F. Gibson and G. J. Stephenson, Jr., both T-5

"Fission Barriers for Even-Even Actinide Nuclei" by J. D. Garrett and B. B. Back, both formerly P-DOR, H. C. Britt, P-DOR, O. Hansen, Niels Bohr Institute, Copenhagen, Denmark, and B. Leroux, visiting staff member in P-DOR

"Fission Barriers for Am, Cm and Bk Isotopes" by H. C. Britt and J. D. Garrett, both P-DOR, B. B. Back, formerly P-DOR, O. Hansen, Niels Bohr Institute, Copenhagen, Denmark, and B. Leroux, visiting staff member in P-DOR

"The Breakdown of the Pairing-Vibrational Scheme Near N = 20" by R. F. Casten, Brookhaven National Laboratory, Upton, N.Y., O. Hansen, Niels Bohr Institute, Copenhagen, Denmark, J. D. Garrett, formerly P-DOR, and E. R. Flynn, P-12

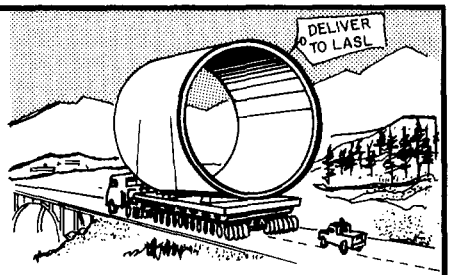
"Physics of Laser Fusion Targets" by R. S. Cooper, L-DO (invited)

"An Empirical Closure Relation for the Vlasov Moment Equations" by H. R. Lewis, P-18, J. R. Asbridge, S. J. Bame and W. C. Feldman, all P-4

Atomic Energy Commission Tamarin Committee, Honolulu, Hawaii, Jan. 30:

"Experimental Observations of Detonations near the Water Surface" by B. G. Craig, M-3

10 years ago in los alamos



Culled from the March, 1963, files of the LASL News by Robert Porton

LASL Scientists Winners of Lawrence Award

Two of the five U.S. scientists receiving the 1963 Ernest Orlando Lawrence Memorial Award are LASL's alternate P-Division leader, Louis Rosen, and James Taub, CMB-6 group leader. Rosen, who has gained international recognition for his studies of nuclear forces, received the award for the development of new experimental techniques and their application to a better understanding of the nucleus, as well as to the diagnosis of nuclear weapons behavior. Taub's nomination for the honor is based upon his metallurgical contributions to the nation's atomic energy program. The metallurgical problems faced and solved by Taub have involved special nuclear materials, difficult shapes and, in many cases, unheard-of dimensional specifications.

Long Haul for a Big Rig

A circuitous route, precision operation of heavy equipment and cooperation of officials in three states, brought safe delivery of the first of three huge "cavities" of PHERMEX, an electron accelerator. Arrival and placement of the 32-ton drum of steel, with its insides clad with copper, means final assembly of the PHERMEX machine can begin. The trip from the fabrication plant in Alameda, Calif. to LASL's R-Site lasted from Feb. 19 to March 2, and took in 2,200 miles of pre-selected highway. The rig and the 635-horsepower diesel tractor that pulled it were 75 feet long and had 42 wheels on the ground, supporting a total weight of 151,000 pounds. The mobile monster usurped most of a standard-sized roadway—it was 17½ feet wide and 18½ feet high.

Only Los Alamos Was Prepared

"Probably the only community in the entire United States which was ready was the one most intimately connected with the nuclear bomb . . . Los Alamos, New Mexico," the "Saturday Evening Post" says of the nation's civil defense during the Cuban blockade when the U.S. neared the brink of war. In his article, "Survival of the Fewest" in the March 23 issue of the Post, Don Oberdorfer terms the state of civil defense in the country, except for Los Alamos, "preposterous" on the night of Oct. 22 when President Kennedy disclosed to the nation that Cuban missiles with nuclear warheads were aimed at the U.S.

what's doing

BIEN DICHO TOASTMASTERS CLUB: Luncheon meeting, 12:05 p.m., Mondays, South Mesa Cafeteria. For information call Beverly Wellnitz, 662-4982.

SIERRA CLUB: Luncheon meeting at noon, first Tuesday of each month, South Mesa Cafeteria. For Information call Brant Calkin, 455-2468, Santa Fe.

RIO GRANDE RIVER RUNNERS: Meetings at noon, second Friday of each month at South Mesa Cafeteria. For information call Jon Cross, 662-7521.

LOS ALAMOS SAILORS: Meetings at noon, South Mesa Cafeteria, first Friday of each month. For information call Dick Young, 983-9770.

SPORTS CAR CLUB DEL VALLE RIO GRANDE: Meetings, 7:30 p.m., Hospitality Room, Los Alamos National Bank, first Tuesday of each month. For information call Hunter Hill, 672-9550, or Wayne Fullerton, 662-4171.

PUBLIC SWIMMING: High School Pool—Monday through Wednesday, 7:30 to 9 p.m.; Saturday and Sunday, 1 to 6 p.m. Adult swim club, Sunday, 7 to 9 p.m.

LOS ALAMOS VOLLEYBALL CLUB: Monday, Girls' gym, Los Alamos High School, Men—6-7:30 p.m., Women—8-9:30 p.m. For information call Don Shepard, 662-7865.

LOS ALAMOS BADMINTON CLUB: Tuesday, 8 p.m. to 9:30 p.m., Girls' gym, Los Alamos High School. For information call Art or Jane Sherwood, 662-2966.

WHITE ROCK KARATE CLUB: Workouts, 8 p.m., Monday and Wednesday, Pinon Elementary School gym. For information call Tom Cook, 672-9426.

MOUNTAIN MIXERS SQUARE DANCING CLUB: Mesa School, 8 p.m., For information call Ruth Maier, 662-3843.
March 3—Louie Martinez, Albuquerque
March 17—Fred Staeben, Palmer Lake, Colo.

LOS ALAMOS CONCERT ASSOCIATION: Civic Auditorium, 8:15 p.m., March 19, Pacifica Brass Quintet. For information call Marilyn Stevens, 662-4873.

NEWCOMERS CLUB: March 21, couples' wine tasting party, 7:30 p.m., Posse Shack. For information call Pat Astle, 662-4709.

LOS ALAMOS OUTDOOR ASSOCIATION: No charge, open to the public. Contact leaders for information.
March 10—San Miguel Ruin and Petroglyphs, John Kirkpatrick, 662-2734
March 24-26—Bandelier backcountry, Bob Skaggs, 662-6957

MESA PUBLIC LIBRARY:
Feb. 22-March 22—Silk screen prints, Jim Wagner, Taos
March 22-April 19—Aspen paintings, Lois Duncan, Los Alamos
March 12-27—Campfire Girls' display

Congressman Mike McCormack, who visited the Los Alamos Scientific Laboratory in connection with his recent appointment to the Joint Congressional Committee on Atomic Energy, shakes hands with Duncan MacDougall, associate director for weapons. At left is LASL Director Harold Agnew.

Members of Q-Division have demonstrated the principle of superconducting magnetic-energy storage for the first time with the help of an electric train. Stored energy was released in a controlled manner to power the model engine. The event was witnessed by Brian Belanger of the Atomic Energy Commission's Division of Applied Technology, kneeling, third from left, and by several members of Q-Division, including Robert Duffield, left of Balanger, Q-Division leader, and Edward Hammel, left foreground, co-supervisor of the division's non-nuclear and applied technology programs. The Los Alamos Scientific Laboratory is developing superconducting magnetic-energy storage technology directed toward more efficient utilization of the nation's natural resources and electrical generating capacity. The idea is that electrical energy will be stored during low-demand periods and released to supplement generating-plant capacity when demand is high.